



*Concepts for
Supporting the
Objective Force
with Field Artillery*

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Purpose

- ▮ **Describe the relationship of the Field Artillery's enduring functions to the application of *firepower* in Objective Force operations**
- ▮ **Describe how FA delivery system units could support the Objective Force Combat Battalion--operationally and organizationally--in the period 2010-2015**

Our Assessment Process

**Understand
New
Operational
Environment
and Its
Challenges**

**Identify
Mission
and Roles
in
Operational
Constructs**

**Identify
Tasks
and
Required
Operational
Capabilities**

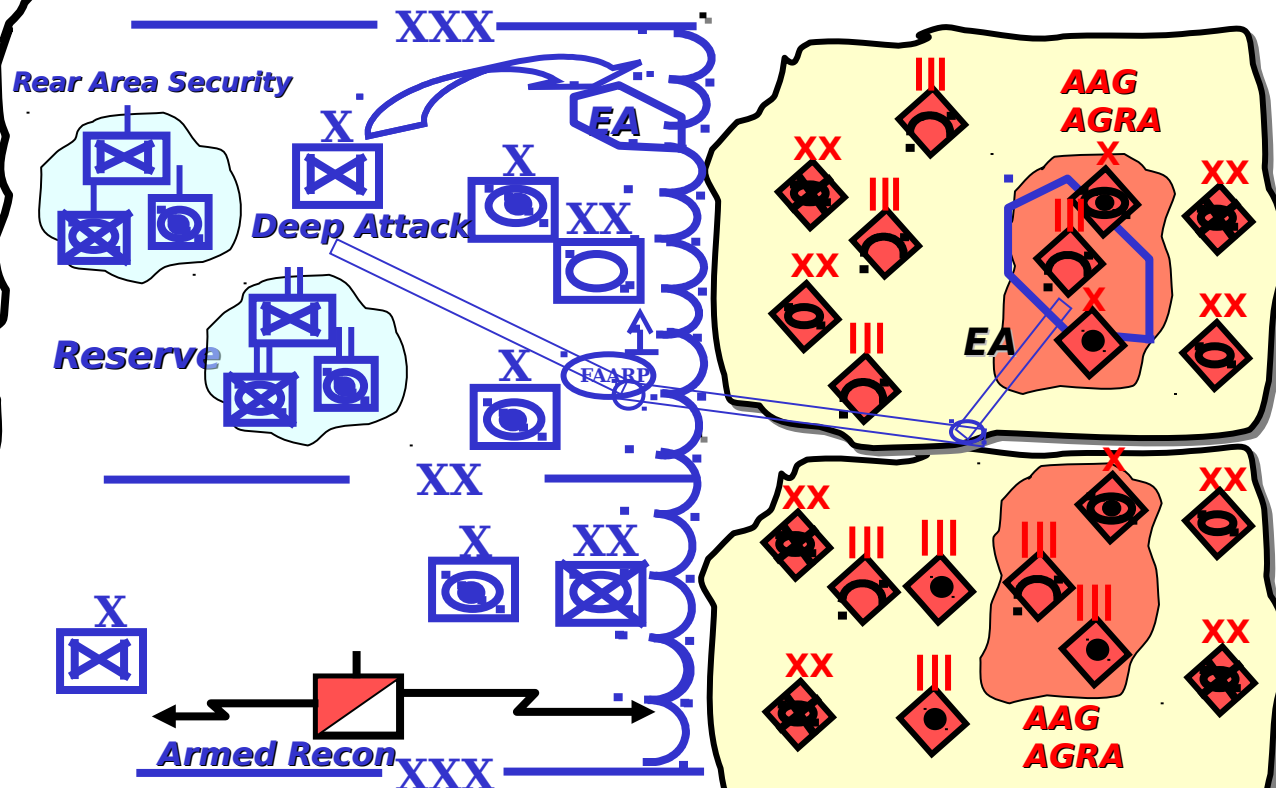
**Assess FA
Potential to
Provide
Required
Capabilities**

***Objective
Force
Capabilities
as Described
in O&Os***

Old Paradigm

Defensive Counterattack

Offensive



Roles

- Close Support Fires
- Counterfires
- Interdiction

Conditions

- Linear battlefield
- Templated enemy artillery
- Massed formations in echelons
- Attrition focus
- Few restraints in collateral damage
- Combatants readily identifiable

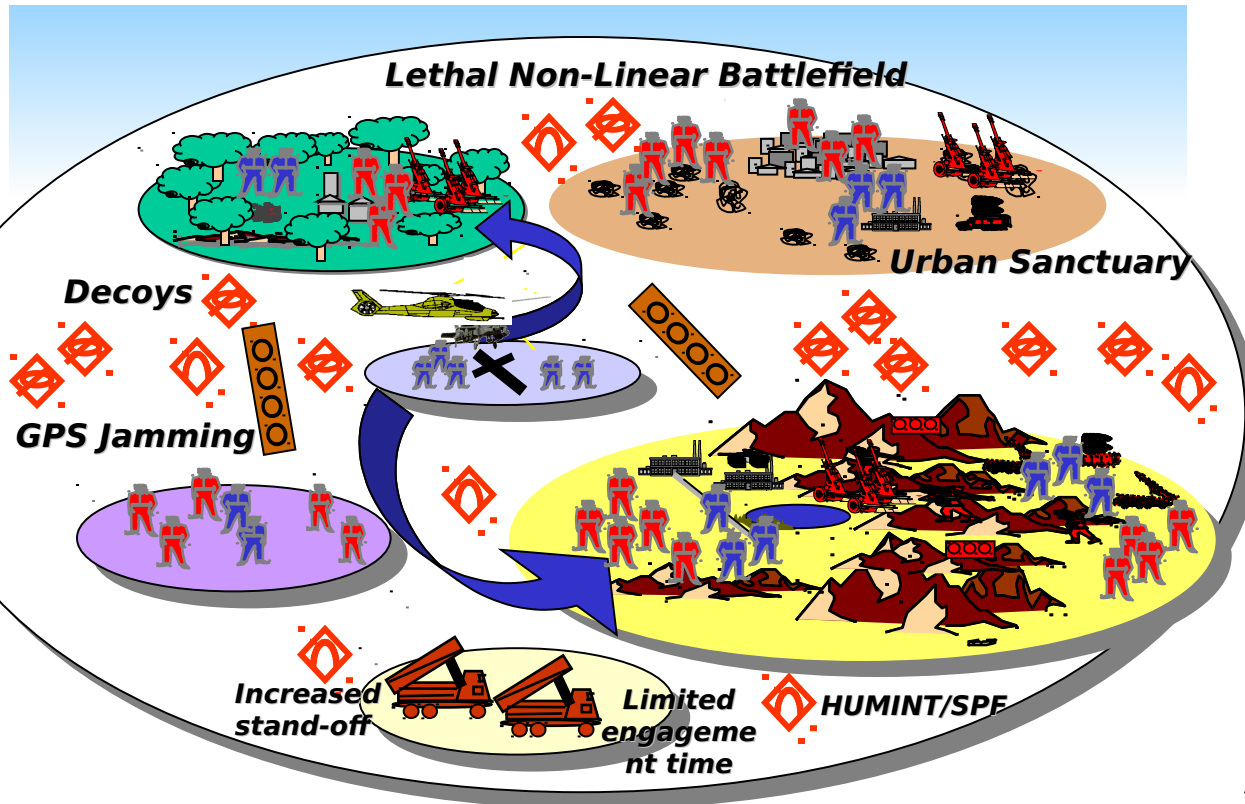
Threats

- Mortar and artillery attack
- Rocket and missile attack
- Enemy air
- Mech infantry and armor direct fires
- Dismounted forces
- SOF
- EW- Jamming Coms, Radars

New Paradigm

Offensive

Defensive



Recon Fires Complex
Recon Strike Complex
Military Systemology

Enduring Functions

- Close Support Fires
- Counter Precision Strike
- Shaping Fires

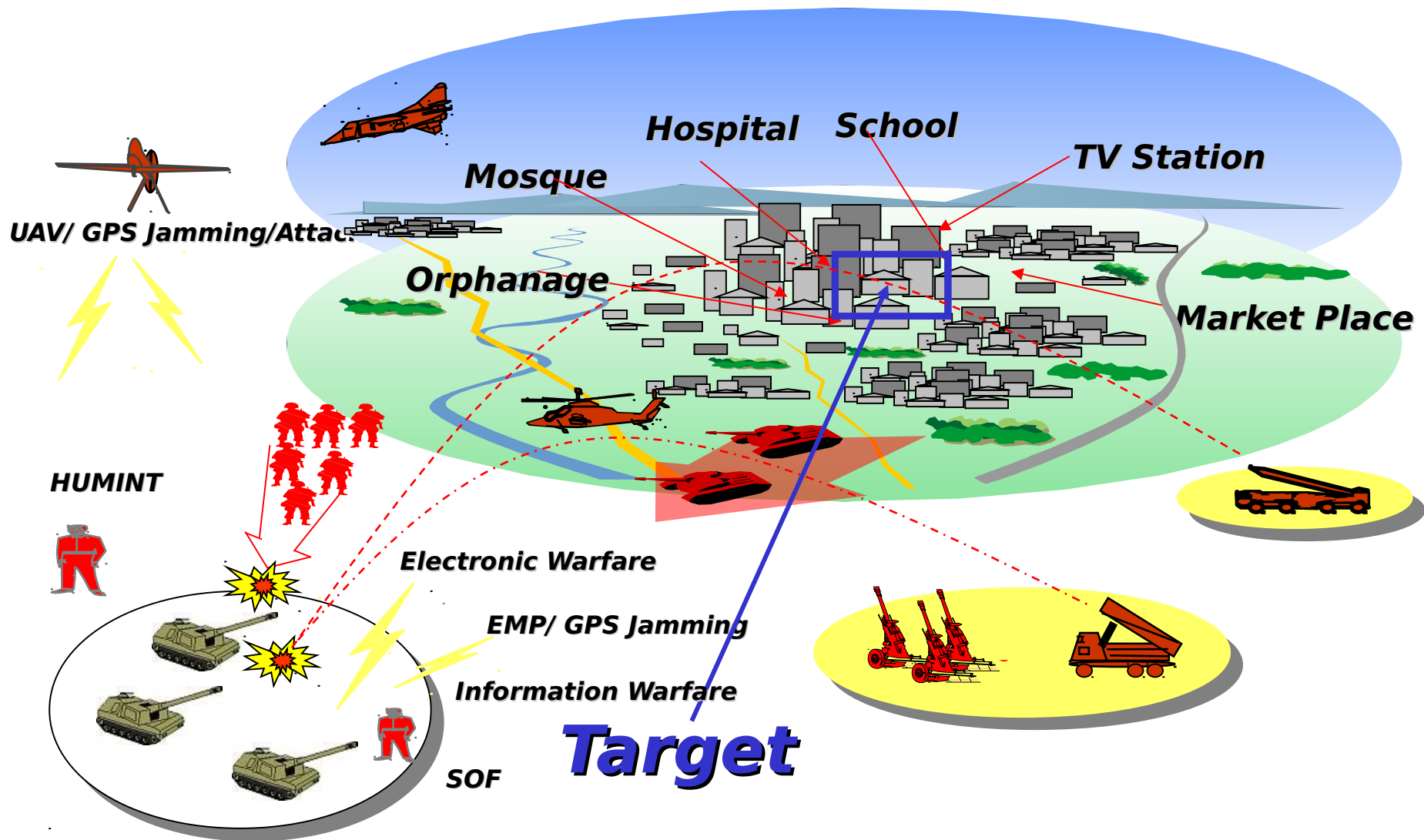
Conditions

- Non-linear battlespace
- Urban sanctuary
- Increased enemy range
- Limited engagement time
- Widely dispersed and smaller formations
- Precision munitions
- Enhanced TA and ISR
- Greater collateral damage aversion

Threats

- Mortar and artillery attack
- Rocket and missile attack
- SOF attacks
- Enemy direct fires

New Paradigm Problem Set



General Artillery Trends

WHY IT'S CHANGING

*Applying Lessons Learned...
Adoptive and Adaptive*

High

Proliferation Trends

Low

- Multifunctional Missile Systems
- UAVs
- Target Acquisition Radars
- Multiple rocket launchers
- Improved munitions

ATTACK
HELICOPTER
AIRCRAFT

TODAY 2000 2015

*Emerging
Capabilities*

- Decreased Logistics
- Advanced munitions
- Enhanced targeting

Emerging Strategies

- Opportunistic in nature
- Redundant C3I
- Dispersed, integrated, and decentralized engagement
- Mixed automated and manual tracking-- win war of weather
- Maximum use of

INCREASING
RISK TO
US
FORCES

Evolution characterized by changes in target sets

Cannon Artillery System Trends

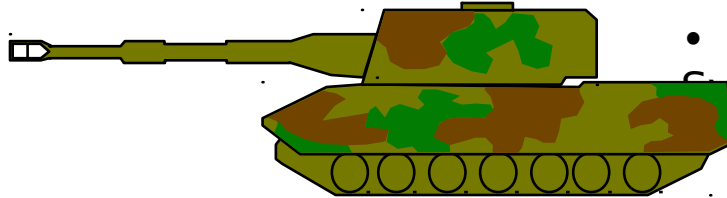
Increased Range

Cannon: 40 - 50 km

- 45-52 Caliber length tube

- Propellant - LPG

MRL: 50 - 90 km (max 150 km)



Decreased Engagement Time

- Direct Sensor to Shooter Link

- UAV
 - IR, EO/MMW
 - GPS / INS
 - Automated Fire Control System (AFCS)
- Rate of Fire: 8-12 RPM

Supportability

- Pallatized Ammunition
- Combustible cartridge
- 152 155 mm systems conversion
- Modular Propellant
- Multi-Option Fuzing

Accuracy & Lethality

Accuracy:

- Smart Munitions: small search area (hit probability >.5)

Lethality:

- Fuzing
- Explosive Fills (RDX & HMX)
- Controlled Fragmentation
- Improved Metallurgy
- ICM/DPICM/TGSM/Scatterable

IMPLICATIONS: U.S. forces will face an enemy capable of conducting precision engagements at any place on the future battlefield.

State of the Art

2S31 120mm Combo Gun (RS)
GHN-45 155mm How (AU)
2S19 152mm SP How (RS)
G-6 155mm ADHSPM How (SF)
ASTROS II & III MRL (BR)
Laser Guided Projectile (LGP)
Sensor-Fuzed Munition (SFM)
Course-Corrected Munition (CCM)
Terminally Homing Munition (THM)

ADHPM - 2000 to 2015

Krashopol 152/155mmLGP (RS)
Hong Tu Di 152mm LGP (CH)
Kitolov 120/122mm LGP (RS)
Smel'chak 240mm LGP (RS)
Ugroza 122mm LG Rocket (RS,IR)
Bussard 120mm LG Mortar (GE)
Ukrainian 120mm LG Mortar
Motiv 3M SFM (RS)
Universal 122, 220, 300mm SFM (RS)
SMArt 155mm SFM (GE)





MRL Trends



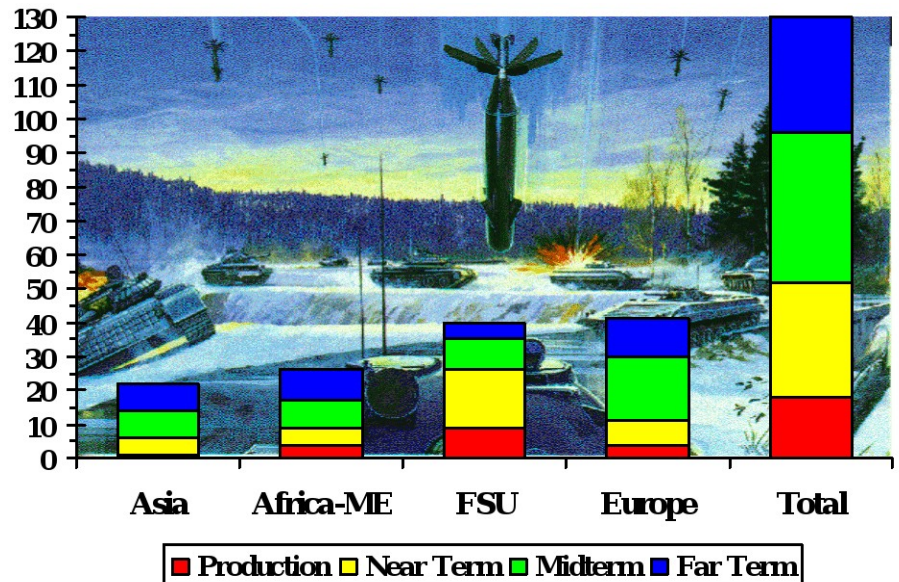
The Poor Man's TBM



***MRLs Provide Capability To Deliver Long Range Precision Munitions
without TBMs***

-  LASER GUIDED PROJECTILES PROLIFERATING RAPIDLY
-  FOUR NEW SENSOR FUZED MUNITIONS IN PRODUCTION
-  COURSE CORRECTED MUNITIONS COMMON
-  TERMINALLY HOMING MUNITIONS BEING TESTED

Strategies
Mobility
Massed Effects
Lethality..CML Capability
Sanctuary Operation



SRBM Trends

Guidance & Control:

- Active Attitude Control System
- Inertial Guidance w/Terminal Digital Correlation
- On-board Digital Flight Computer

Improved Warhead Options:

- Enhanced Blast
- NBC / Fuel Air Explosive
- Improved ICM
- Terminally Guided Homing
 - Subminitions
- Anti-radiation Homing
- On-board Target Acquisition
- Maneuvering

Most Common
EROCM7 (RS)
SCUD Variants
SCUD-B (RS)
Al Hussein (IZ)
No-Dong (NK)
SS-21 (RS)

State of the Art
SS-21 (RS)
SCUD-B (RS)

Propulsion

Solid Fuel

Transporter Erector Launcher

- Survivability:
 - Low Observable Features
 - NBC protection
 - Lightweight armor
- Automated Fire Control
- SATCOM Digital Downlink: C3, GPS, TA, FD
- Shorter set-up time

Accuracy & Range:

- Range: Minimum 100 km
Maximum 1000 km
- CEP: 10m at min range
< 100m at max range

Staging

Multiple Stages



Fires Implications

Operational Environment Highlights:

- Wider spectrum of operations, increased threat technological capability and unpredictability leading to a more **complex and challenging range of operating environments** . . .
- In association with an “Adaptive and Adoptive Threat”
- A challenge for independent maneuver
- Complex and difficult fires requirements
- Suggests Combined Arms operations
- Extremely lethal, offensively oriented artillery environment
- Degradation of U.S. technological superiority
- Changed target sets
- Changing range of threats



Emerging Military Capabilities



Urban/Complex Terrain



Asymmetric Threats



Emerging Military Strategies

Fires Challenges in D2 + A

- **Most of our current and emerging Field Artillery capabilities were created for Soviet threat in European terrain. Desert Storm requirements were similar**
 - ▢ **Largely dependent on massed fires against area targets**
 - ▢ **Engagement of fleeting targets very challenging**
 - ▢ **Kosovo saw use of sanctuary and protection of urban and complex environments keyed to perception of US aversion to unrestricted collateral damage**
 - ▢ **Serbs exploited civilians as a protective shield through “hugging”**
 - ▢ **Most of our target acquisition assets not discriminatory for civilians, paramilitary, and unconventional capabilities**
 - ▢ **Fusion of intelligence for targeting starting to emerge--still not real-time in most cases--causing latency or changes to enemy force disposition**
 - ▢ **Many countries with overmatch in quantity or range for precision strike capability**
 - ▢ **World trend toward upgrades in precision munitions rather than delivery systems**
 - ▢ **Establishing and maintaining long range, secure digital communications still major challenge**

Target Sets and Challenges

- Next generation armor
- Light armor and motorized
- Surface to Surface Missiles
- Integrated and autonomous ADA systems
- TA radars and other RSTA
- Multiple rocket launchers
- ATGMs
- Special purpose forces and paramilitary
- Long range cannon artillery
- Mortars

Identification of combatants

Collateral damage and ROE

Wide dispersion of Mech and armor units

Use of urban sanctuary

Limited engagement time

Proactive attack

Stand-off range of enemy systems

Protection of our systems

Our Assessment Process

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Objective
Force
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New Operational Construct

Operational Fires to:

- Destroy forces or systems at depth
- Shape future operations
- Provide complementary effects

Operational Zone

Tactical Shaping

Close Support to:

- Destroy enemy forces ICW Maneuver as part of assured destruction
- Fix and suppress to enable freedom of maneuver
- Help gain or hold terrain

Combat Battalion

Close Fight

Counter Precision Strike

Tactical Shaping Fires to:

- Shape next close fight
- Isolate current close fight
- Fix and suppress to enable freedom of

Tactical Shaping

Close Fight

Combat Battalion

Enduring Functions

Enduring nature of fires remains centered on

Close Support Fires for Decisive Operations

The attack of enemy troops, weapons, or positions to destroy or compel enemy forces in close combat as part of Decisive Operations and to fix or suppress to

Counter Precision Strike

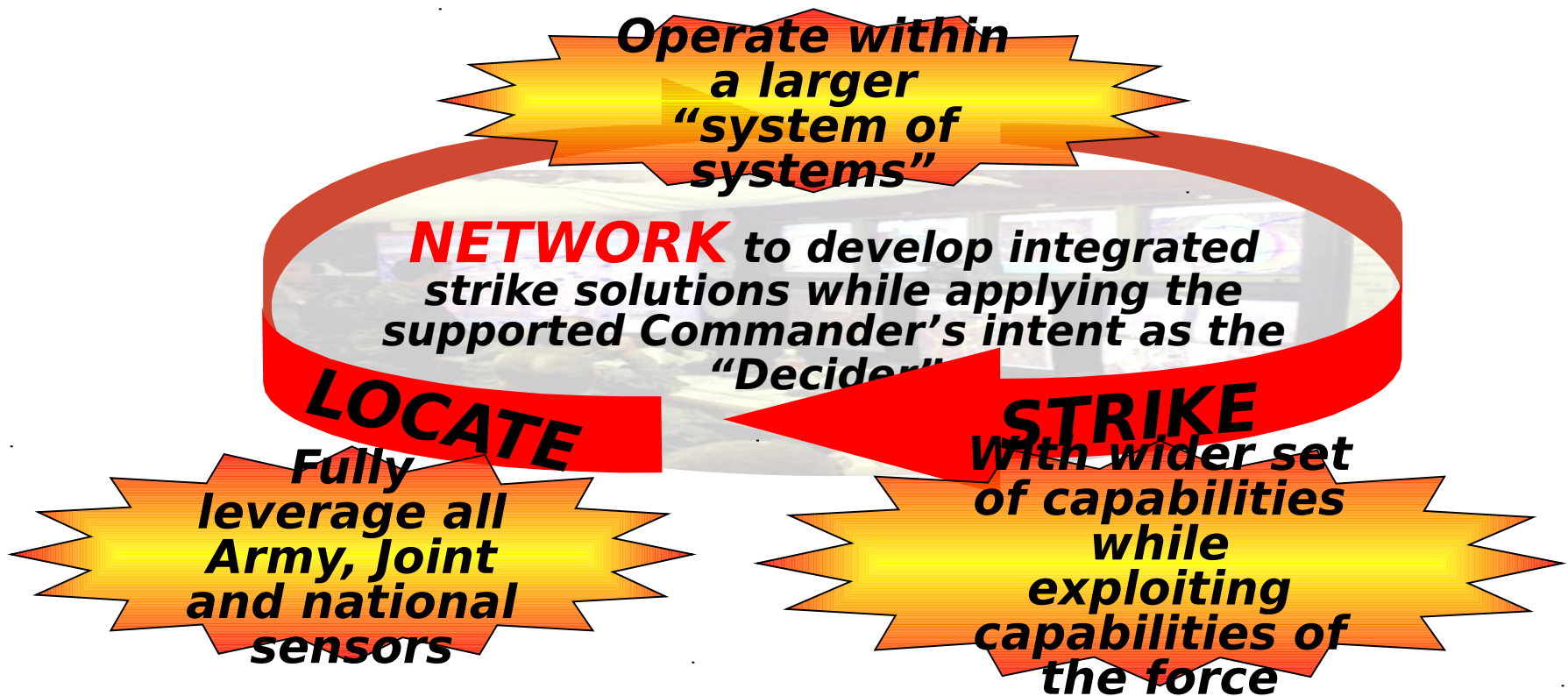
The destruction of the enemy's total strike capabilities (indirect fire and ADA), C4ISR, support systems, and logistics areas. Focus of efforts are predominantly preemptive to attack the enemy before he

Shaping Fires at Tactical and Operational Depth

The attack of enemy forces beyond the Close Fight to: set conditions for Decisive Operations, isolate the current Close Fight, shape the next fight, and

While the conduct is evolving

Networked Fires



For Field Artillery: Strike capabilities are product of both delivery systems and munitions that provide three types of terminal effects:

- ✓ Area
- ✓ Point - precision, smart, and discriminating
- ✓ Special (lethal and non-lethal)

Close Support Fires

Maneuver Tasks

- Decisive action to destroy or compel enemy
- Gain or hold terrain

Organic

FCS



External Supporting

Crusader



NetFires



STRIKE with Close Support to:

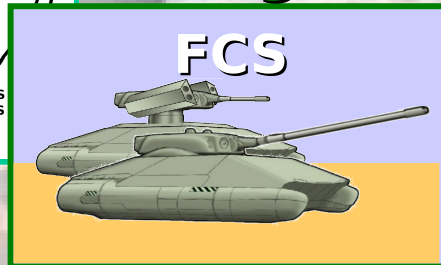
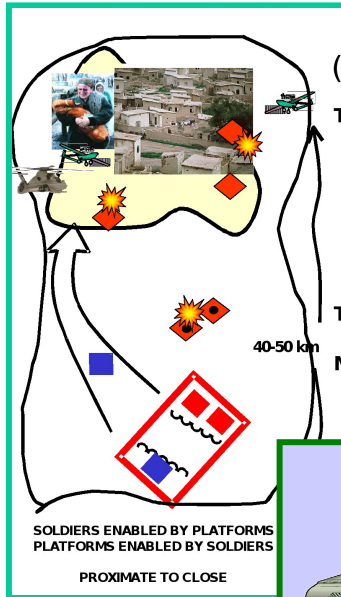
- Destroy enemy forces ICW Maneuver as part of assured destruction
- Fix and suppress to enable freedom of maneuver

- Next generation armor
- Light armor and motorized
- RSTA
- ATGMs
- Special purpose forces and para-military
- Medium cannon artillery
- Mortars
- HUMINT
- Dismounted forces

Shaping at Tactical Depth

Maneuver Tasks

- Destroy or control threat
 - Determine & shape next close fight
 - Isolate current close fights
 - Protect the force
- Organic**



STRIKE with Shaping Fires to:

- Shape next close fight
 - Isolate current close fight
 - Fix and suppress to enable freedom of maneuver
 - Potentially be decisive
- Next generation armor
 - Light armor and motorized
 - TA radars and other RSTA
 - MRLs
 - IADS
 - Long range cannon artillery
 - SSM
 - C2 nodes

External Supporting NetFires



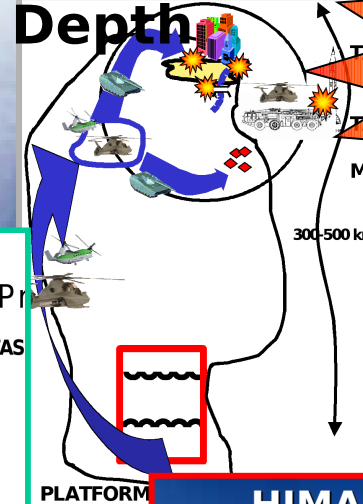
Countering the Enemy's Precision Strike

Tasks

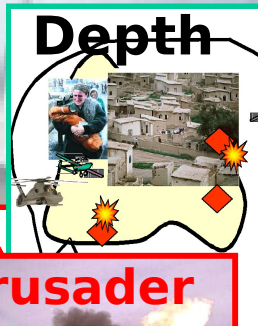
- Allow freedom of maneuver
- Protect the force

Threat can strike throughout the battlespace

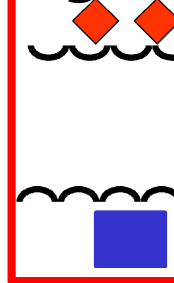
Operational Depth



Tactical Depth



Close Fight



Crusader



NetFires



HIMARS



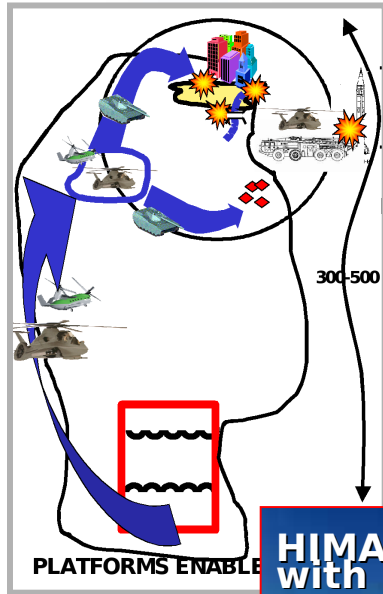
- Mortars
- Towed artillery
- Towed rockets
- SP cannon artillery
- MRLs
- SSMs
- IADS
- Supporting systems

External Supporting

Organic

Proactive the norm—reactive the exception

Shaping at Operational Depth



Maneuver Tasks

- Destroy or control threat
- Protect

External Supporting

HIMARS
with
ATACMS

NetFires

**Critical
complement
ary
capabilities
for JFACC
and Army
aviation**

**Provide
unmanned
operational
reach
capabilities
as part of
Mobile
Strike**

STRIKE with Operational Fires to:

- Destroy forces or systems at depth
- Shape future operations at depth

- Next generation armor
- Light armor and motorized
- MRLs
- IADS
- SSM
- C2 nodes
- Logistics sites